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September/October 2007 \$5.00



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Winning Students

Reducing Downtime

New Solutions
for Brushless Exciter

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New solutions for brushless exciter help reduce downtime. Page 20.

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September 16-18, 2007; Maui, HI

Speakers will cover business and technical aspects of On-Site Power Generation and current industry trends. For information, visit www.EGSA.org or call (561) 750-5575.

EGSA 2008 Annual Spring Convention

March 16-18, 2008; Santa Ana Pueblo, NM

The Association's Annual Convention of Members. Speakers will cover business and technical aspects of On-Site Power Generation and current industry trends. For additional information, visit www.EGSA.org or call (561) 750-5575.

Schools

EGSA On-Site Power Generation School

Atlanta, GAOctober 22-26, 2007

New Orleans, LA.....December 10-14, 2007*

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*To be held concurrently with POWER-GEN International

Industry Trade Shows

POWER-GEN International 2007

December 11-13, 2007; New Orleans, LA

The world's biggest show for power generation, featuring the EGSA On-Site Power Pavilion. For exhibit information, contact EGSA at (561) 750-5575, ext. 205 or e-mail Jalane Kellough at J.Kellough@EGSA.org.

POWER-GEN Asia 2007

September 4-6, 2007; Bangkok, Thailand

Recently combined with China Power, this event is one of Asia's biggest power generation shows. For information, visit www.powergenasia.com.

Vietnam Electricity Expo 2007

December 5-7, 2007; Hanoi, Vietnam

Fully supported by the Vietnamese Ministry of Industry and Electricity and held in rotation with Hochiminh City since 1992, focusing on small to midsize thermo and hydroelectric projects. For information, visit www.cpexhibition.com.

Look for more industry events in our up-to-date calendar on the web at www.EGSA.org. EGSA Members: To list your meetings here, fax your information to (561) 395-8557.

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Throughout every issue of *Powerline*, trademark names are used. Rather than place a trademark symbol at every single such occurrence, we aver here that we are using the names in an editorial fashion only. EGSA has no intention of infringing on these trademarks.

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Gary Kidwell
2007 EGSA President

The Benefits of Membership: Manage Your Investment Wisely

When you invest in an opportunity, chances are you don't blindly hand off your money, walk away and hope for the best. Instead, you watch that investment and manage it as effectively as you can to ensure that it returns some sort of dividend. The truth is, we make many investments every day. Some involve money and time, others require energy and effort. Whatever the required expenditure, you probably employ the same strategy in every circumstance: focus on committing your resources to those opportunities that will provide you with the most positive and effective returns.

Your choices speak to your abilities, and the success—or failure—of those choices can have a direct impact on your personal success. Good choices demonstrate your ability to lead and bring about positive change. Poor choices, on the other hand, can lead you to ruin. That's part of what makes EGSA membership so valuable. Not only does your membership demonstrate that you are a leader in your industry, but it also provides you with a wealth of positive returns.

Exhibit opportunities within the EGSA On-Site Power Pavilion at POWER-GEN, for example, allow your firm to demonstrate it is aligned with—and active in—the world's largest event for power generation, transmission and distribution products and services. And thanks to the Pavilion's prime location on the show floor, On-Site Power—and your firm—is now literally in the forefront of today's electrical generation, transmission and distribution industry. This important membership benefit provides you and your firm with the highest degree of visibility at the best cost. You also have the opportunity to deliver your message to the industry thanks to member discounted advertising rates for *Powerline* magazine. Take advantage of these benefits to show that you and your firm have your sights firmly fixed on where the industry is headed.

Uniting the On-Site Power Industry

The most important benefit of membership in EGSA is the opportunity to network with your peers at conferences and meetings where there is ample opportunity to meet in a relaxed atmosphere. Developing contacts among On-Site Power

Manufacturers, Distributor/Dealers, Reps, and others is crucial to the success of your business. Take advantage of these opportunities to show that you and your firm should be counted among the industry's top players.

EGSA conferences and meetings provide further benefit to you and your firm through education. Thanks to a long-held belief that education is the key to improving our industry, the Association has an excellent reputation for providing high-quality educational programs. Forgo these opportunities and you and your firm could fall behind the competition as you lose touch with the industry's latest innovations.

EGSA membership offers a wide range of benefits to you and your firm. You both benefit because EGSA places a high value on the individual and maintains that commitment through educational programs initiatives such as Continuing Education Units (CEUs) and our Generator Technician Certification program. However, if you don't participate, if you don't get involved in the Association and actively support its endeavors, your benefits are greatly diminished. It may sound trite, but it's painfully true: you get what you pay for.

Membership is not just an investment of yearly dues, it's an investment of time, energy and effort. The greater the participation, the greater the return. So, I encourage you to manage your investment wisely. Nurture it and your rewards—now and in the future—will be great. Neglect your investment and it will stagnate. The choice is yours. Choose wisely!

Postscript

The benefits of membership are often most appreciated when they are liberally shared. Why not encourage your business associates, clients and vendors to investigate whether EGSA can benefit them? Complete membership information is available online at www.EGSA.org. ■



*George Rowley
EGSA Director
of Education*

25 Years of EGSA Power Schools

We're about to celebrate a 25th anniversary! It was in Denver, Colorado in June 1983 that the first EGSA On-Site Power Generation School was held. For the first ten years, we conducted two schools each year. The Board of Directors responded favorably to member requests for more varied locations (most of the schools for the first ten years were held in Florida) and we began conducting our schools in diverse geographic locations across the country in 1994. Demand for and attendance at our schools has also steadily increased over the years; in 1994, the number of schools per year was expanded from two to three and to four per year in 1999, and we have conducted four or five schools per year since then. Attendance has increased from an average of 15 or 16 students per school in the early years to an average of 40 students per school in the past two or three years. Our best-guess estimate is that more than 2,100 students have attended and benefited from our schools over the years.

Instruction and our Instructors have evolved too. As changes in technology occurred, the content of the school has kept pace; there have been many changes in the curriculum and individual modules are in an almost continuous process of revision and updating. The early schools boasted a core group of about five instructors from a few member companies who taught the entire school. It now takes 12 instructors to teach the full Core Program and Optional Seminars. Our instructor pool now numbers over two dozen instructors and will increase this fall as three or four new instructors are added to the pool. Along with the two instructors who have retired, 20 member companies give their personnel time to teach at our schools and support EGSA.

What has not varied much over the years is the "profile" of students attending our schools. Most recent data shows that Engineering personnel comprise 15% of students, Sales and Marketing 45%, Service 26%, Management 9%, and Other 5%. To meet the diverse needs of students in attendance and to adjust the level of content so that all can understand what is being taught has always been a challenge and it is a tribute to the skill and knowledge of our instructors that we have been successful most of the time. However, we have found a better and innovative way to meet this challenge.

Presenting our new Two-Tiered School

For several years, the Education Committee and the instructors have been planning and developing

the most significant and major curriculum change in the 25-year history of our school. Beginning in 2008, we will offer 3-day "Basic" Schools and 4-day "Advanced" Schools. The new curriculum is designed to better meet the needs and diverse backgrounds of those who attend our schools. In 2008, we will schedule three Basic Schools and two Advanced Schools and we will make annual adjustments based on feedback and data from those who attended the previous year.

We have "lightened up" several modules for the Basic School and "beefed up" those same modules for the Advanced School. "Starting Systems," "Emissions," and "Noise Control" modules have been included in the Advanced school. In addition, we have eliminated Optional Seminars and have incorporated them into the appropriate Basic or Advanced School curriculum. The Basic School will be a 3-day school and the Advanced school will be a 4-day school.

Who Should Attend Which School?

We plan the Basic School to be a general, but technical, overview of On-Site Power Generation equipment whereas the Advanced school will offer more highly technical and in-depth coverage of the equipment. Our guidelines for who should attend which school are:

The Basic School is designed for those that are working in non-technical positions (such as Sales or Marketing, Administrative, or Management positions) and for those with less than three years experience working in the industry.

The Advanced School is designed for those who have attended the EGSA Basic On-Site Power Generation School; those employed in Engineering, Project Management, or Service positions; and for those with over three years working in the industry.

Detailed information, including the module descriptions and learning outcomes will be available in the fall. Watch for mailed and e-mailed announcements, and check our web site and *Powerline* magazine for information. If you have comments or questions about our school or any EGSA education-related program, please contact George Rowley, EGSA Director of Education. George's e-mail address is G.Rowley@EGSA.org or he can be reached by phone at 562-237-5557. ■



Techs Stand Apart from the Competition with the EGSA Certified Electrical Generator Systems Technician logo

Do you or your techs use this patch? This is the patch used only by EGSA Certified Technicians. It sends a clear message that the tech and the employer are special. The tech has proven skill and knowledge through passing a rigorous test; The employer is committed to excellence and high standards. Techs who have earned the title "EGSA Certified Electrical Generator Systems Technician"—use the logo with pride!



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| <input type="checkbox"/> FSU 122 | <input type="checkbox"/> FSU 123 | | Self-Adhesive Decal (4"x6") —These heavy-duty adhesive-backed vinyl decals are made to hold up to exposure to the elements. To help resist fading and weathering, the images are printed with UV-resistant ink and we have applied an extra coating to further protect the image from fading and abrasion. | <input type="checkbox"/> \$10 | <input type="checkbox"/> \$15 | |
| <input type="checkbox"/> FSU 124 | <input type="checkbox"/> FSU 125 | | Self-Adhesive Decal (8"x10") | <input type="checkbox"/> \$20 | <input type="checkbox"/> \$25 | |

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Herb Whittall
EGSA Technical Advisor

NFPA is Recruiting Committees

Earlier this year members of the code making panel for Electrical Systems for NFPA 110, *Standard on Emergency and Standby Power Systems*, were asked to comment and vote on a formal interpretation to the 2005 Edition of NFPA 110 by answering three questions. The answers were **Yes** or **No** or **Abstain** or **Other**. The answers under **Other** were: *A yes or no answer would be inappropriate, or Formal interpretation should not be issued based on one of the reasons indicated in 6.1.4 of the NFPA Regulations Governing Committee Projects.*

Question 1: Is it the intent of paragraph 8.4.2.3 to require an annual test independent of the monthly test as required by 8.4.1, therefore requiring a 2 hour and 30 minute exercising of the EPS?

Question 2: If the answer to Question 1 is no, is the intent of paragraph 8.24.2.3 to require the 4 hour test every 36 months to be independent of the test as required by 8.4.9, therefore requiring a 6 hour exercise of the EPS?

Question 3: If the answer to question 1 & 2 above is no, is it permissible to combine the tests required by paragraphs 8.4.2, 8.4.2.3 and 8.4.9 into one 4 hour exercising of the EPS to meet the requirements of 8.4.9?

In my way of thinking the answers were **No** to questions 1 and 2 and **Yes** to question 3. There were 11 members eligible to vote. Three others agreed with me. Two did not return their ballots. The other five all voted **Other** to questions 1 and 2. Those that voted **Other** felt that questions 1 and 2 were leading questions and they could not be answered with a straight yes or no because it would depend on how the tests were run. One also felt the Formal Interpretation was technically flawed. What this all means is that the questions raised to the committee will have to wait and be resolved at during the next cycle and published in the 2011 version of NFPA 110.

NFPA is looking for members for some of its committees. For NFPA 99 *Standard for Health Care Facilities* NFPA needs members in all interest categories for the *Technical Correlating Committee* and the *Electrical Systems Committee*. NFPA 37 *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines* is looking for members in the category of *User*.

NFPA is also soliciting proposals which must be received by 11/26/2007 for the following

Standards: NFPA 99-Standard for health Care Facilities; NFPA 110-Standard for Emergency and Standby Power Systems; and NFPA 111-Standard for Stored Electrical Energy for Emergency and Standby Power Systems.

I see that New York State Fire Prevention and Building Code Council has voted to adopt the 2003 *International Building Code*, *International Fire Code*, *International Energy Conservation Code* and most of the other International Code Council (ICC) codes with state modifications. This means that those of you in New York State who have not had problems with the Fire Marshall requiring the extensions to the breather tube and fuel filler neck on enclosed package generator sets will probably being required to make those modifications in the future. Also, California has determined that the 2007 California Fire Code will be based on the 2006 International Fire Code.

New York City Mayor Bloomberg has submitted a plan to tie the *New York City (NYC) Construction Codes* to the ICC's three year cycle in the future. Seems the NYC *Construction Codes* had not really been updated since 1968.

The IEC has changed its policies to speed up the process of reviewing and publishing new standards or new versions of Standards. They have cut down on the steps and the time from notification until comments or a vote must be submitted. There are now three steps:

CD1 – a thorough review and thorough comments (technical, general or editorial) because the document might just go to CDV instead of CD2.

CD2 – thorough comments contributing to a final document.

CDV – technical comments allowed but not major. Voting is imperative. When comments are implemented, the document must be proofread and sent to the Secretariat as “perfect”. The project team is then disbanded and the document published.

The US TC 70 committee of the ISO has posted Systematic review Ballot for ISO 8528-12:1997 ISO/TC 70 2007-12-17 *Reciprocating internal combustion engine driven alternating current generating sets – Part 12: Emergency power supply to safety services*. If anyone is interested in seeing this document – the 2007 update to the 1997 issue of ISO 8528 Part 12 – please contact me either through EGSA or via email at hwhittall@comcast.net. ■



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POWER-GEN & EGSA New Orleans School Housing

Are you attending POWER-Gen International 2007? If so, make your hotel reservations now. The Marriott Convention Center will serve as EGSA's "headquarters hotel" during POWER-GEN International and for the EGSA New Orleans On-Site Power School. Rooms have been secured at a rate of \$159 single/double.

A Housing Request form for POWER-GEN International (December 11-13, 2007) and the EGSA New Orleans On-Site Power School (December 10-14, 2007) is available by visiting our web site at www.EGSA.org.

You must return the housing form to the housing bureau, EXTRAS, by November 9, 2007 in order to secure your room. Any rooms left unassigned as of November 9, 2007 will be released and sold to the general public.

POWER-GEN Exhibitor Kit Available

The POWER-GEN International 2007 exhibitor kit is now available online at <http://pgi07.events.pennnet.com/fl/index.cfm>. Your password to access exhibitor materials should have been e-mailed to you. If you have not received your login information, please contact Steve Wood at PennWell. You must log in to the POWER-GEN site to order electrical access, furniture, lead retrieval, register booth staff, etc.

Space Available in the Atlanta, New Orleans Schools

Students may still register for EGSA's last two—Atlanta and/or New Orleans—On-Site Power Schools for 2007. Attendees can obtain up to 3.1 CEUs and registrants for the Core Program will receive a copy of On-Site Power Generation: A Reference Book

The On-Site Power Generation School's Core Program Covers the Following Areas: Generators/Alternators, Voltage Regulators, Governors, Engine/Generator Instrumentation & Control, Introduction to Generator Protection, Automatic Transfer Switches, and Generator Systems: from Sizing to Service.

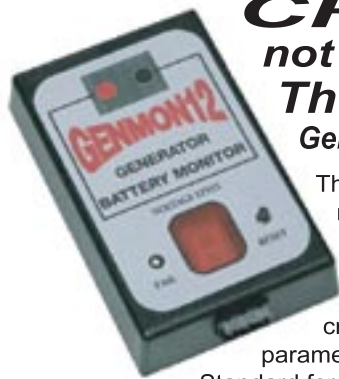
More training is available through optional classes: Basic Electricity, Prime Mover Fundamentals, Troubleshooting Service Problems, Understanding Specification & Bid Documents, and Multiple Generator Switchgear and Generator Controls.

The Atlanta school is scheduled for October 22-26; the New Orleans school is scheduled to be held December 10-14 (concurrently with POWER-GEN International 2007).

For complete information on EGSA's On-Site Power Generation Schools, Registration, Hotels and CEUs, please visit our website at <http://www.egsa.org/education/schooldates.cfm>.

Was that your last CRANK?

not if you're using The GENMON12 Generator Battery Monitor

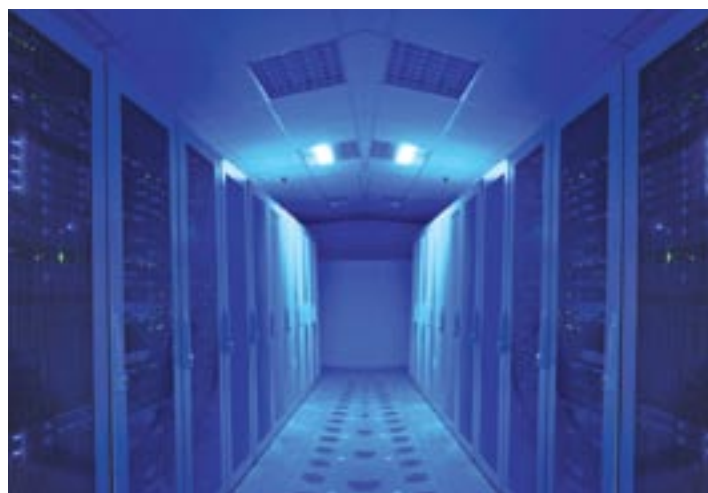


The GENMON12 is designed to monitor generator cranking batteries to determine if the battery is capable of performing during a cranking cycle. The monitoring parameters are based on the EGSA Standard for Engine Cranking Batteries.

The unit can be used to insure that the battery is capable of maintaining 1.50V per cell during a rolling current draw. The unit has a real-time LED display that will continuously show the voltage level of the battery. This display will also show batteries that are not fully charged, or being overcharged. During a cranking cycle, the unit will latch a failure LED and trigger an onboard dry contact if the battery falls below the cranking rate setpoint. The dry contact can be used to interface to an optional audible alarm, or to an existing BMS system.

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EGSA Board of Directors Proposes Amendment to the Current EGSA Bylaws

The EGSA Board of Directors has recommended that "Article 1, Section 1. Full Membership" be amended to include a "Contractor/Integrator" category. The Amendment will be put to a vote at the Annual Meeting, September 18, during the EGSA 2007 Annual Fall Technical and Marketing Conference at the Grand Wailea Resort in Maui, HI. The complete text of the amendment is as follows:

Article 1 Members

Section 1. Full Membership

c. Contractor/Integrator Membership

Any individual, sole proprietor, partnership or corporation actively engaged as a Contractor or Equipment Integrator of products listed under Manufacturer Membership, not brand by brand, geographic territory or contractually obligated as a Distributor/Dealer of a specific product. These firms typically purchase products from a Distributor/Dealer, Manufacturer or Retailer, adding value through installation, product knowledge, relationships, unique services, etc., and then re-sell the resulting product to an end-user.



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For Salespeople: How to Get Up When You're Down

By Dave Kahle



I've been pondering an email I recently received. In it, the young salesperson described his most pressing challenge: The sales roller coaster. When things go well, he's up, emotionally, and when things don't go well, he's down. The swings from up to down were wearing on him. His real question is one every salesperson must confront and successfully resolve: How do I manage myself to keep my emotions up and my energy high?

I've often thought that this is a fundamental challenge for a salesperson. It's one thing to focus on closing the sale, and presenting to a sufficient number of prospects, and other such tasks, but the real heart of the issue is managing yourself so that you can do these things.

If you are depressed and listless, it doesn't matter how good you are at your selling skills. You won't have the energy to apply yourself. Managing yourself is the first challenge.

The depth of this challenge is unique to the profession of sales. In most other jobs, you know what to do, where to go, and when to do it. Not so in sales, where all these decisions are yours to make. Thus, you have the option of not being at your first call at 8:00 if you choose not to. And you have the option of taking a two-hour lunch, and being done at 3 PM. At least for awhile, till someone catches up with you.

If you have a positive attitude, an optimistic mindset, and are "up" emotionally, all these decisions are a lot easier to make

than if you are dragging around in a state of depression.

I know about this, because I am given to depression. I'm a type A, high energy guy. But, I have the tendency, when things aren't going my way, to become depressed. Let me illustrate.

In one of my sales jobs, I encountered a slow down in the amount of projects I had going -- just a lull in the usual feverish level of activity to which I was accustomed. I became depressed.

You know, there is a cycle to depression. For me, it went like this. Since I didn't have as much to do, I became depressed. Since I was depressed, I wasn't nearly as active as I had been. Since I wasn't as active, I didn't create much new activity. Which

meant I had even less to do. Which meant I became more depressed. Which lead me to even less activity. See the cycle?

It doesn't take long to become almost paralyzed. That's what happened to me. I became so depressed that I couldn't leave the house.

In my case, it took the intervention of a wise sales manager to lift me out of my depression and get me back to work.

But not everyone has that option. And not everyone becomes that depressed. But, on a day-to-day basis, the impact of being "down" can be lethal to your success. So, every salesperson has to formulate an effective answer to the question, "How do you get yourself back up when you are down?"

Let me propose two options.

1. Change your thinking.

Our thoughts lead to our attitudes. Our attitudes lead to our actions. Our actions lead to our results. It sounds so simple, and in one sense, it is. To manage

ourselves effectively, all we have to do is control our thoughts. Probably the greatest principle of self-improvement is this: You can choose your thoughts.

There certainly is nothing new about that observation. Solomon, writing centuries before Christ, said "As a man thinks in heart so is he." The Apostle Paul wrote, "Be transformed by the renewing of your mind." The relationship between thoughts, actions and results has been recognized probably since the dawn of mankind. The problem is, of course, actually doing it.

One of the best business books of the 20th century was called "Learned Optimism" by Dr. Martin Seligman. In it, he describes his lifework. As a research psychologist, Dr. Seligman began by studying helplessness in dogs. In an early experiment, he put dogs into a cage from which they could not escape, and subjected them to mild shocks. After some effort at escape, the dogs would give up trying and lay down. Later, he put them into a cage from which they could easily escape, and

subjected them to the same mild shocks. The dogs would just lie down and give up. Surprisingly, they did not attempt to remove themselves from the irritant. They had learned helplessness and hopelessness.

In subsequent experiments, Dr. Seligman found a similar behavior in human beings. Put into a room and subjected to irritating noises from which they could not escape, they soon learned to give up. When put into a room with a mechanism that would turn off the noise, they still didn't try. They had learned helplessness and hopelessness.

From this beginning, Dr. Seligman continued to formulate a thesis he calls "learned optimism." It says, basically, that human beings learn to have either a pessimistic or an optimistic outlook. Dr. Seligman's book contains a self-assessment to measure the degree of pessimism or optimism of the reader.

Dr. Seligman's thesis arises from the way people explain negative events to

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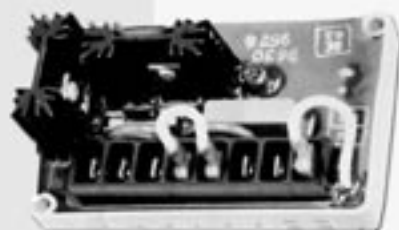
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How to Get Up When You're Down

themselves. When something negative happens, as it eventually will, the way you explain it to yourself determines your pessimistic/optimistic attitude. There are three components of this "explanatory style."

The first component is the degree to which you believe the event will be permanent. Pessimists believe negative events will be permanent, while optimists believe that they will be temporary.

The second component is pervasiveness. Pessimists believe the causes of negative events are universal, affecting everything they do. Optimists believe them to be specific, and limited to the individual circumstances.

The third component is personal. Pessimists believe that negative events are caused by themselves. Optimists believe that the world is at fault.

Here's how this behavioral perspective works in the everyday life of a salesperson.

Let's say you visit one of your large accounts, and your main contact announces that the vice-president for operations has

signed a prime vendor agreement with your largest competitor, and that all of your business will be moved to that competitor within the next 30 days. That's a negative event.

As you drive away from the account, you think to yourself, "I blew it here. I should have seen it coming. I'm never going to learn this job. I'll blow the next one too. I mismanage them all."

Now, that's a pessimistic explanation of the event. Notice that you have explained it in a way that is personal, "I blew it." Your explanation is also permanent, "I'm never going to learn to do this job," and pervasive, "I mismanage them all."

Now stop a minute, and analyze how you feel as a result of this explanation. Probably defeated, dejected, depressed, and passive. These are not the kinds of feelings you need to energize you to make your next sales call.

Let's revisit the situation, this time offering optimistic explanations. The same event occurs -- you receive bad news from your best account. As you drive away, you

think to yourself, "They really made a bad mistake this time. It's a good thing the contract is only for a year. That gives me time to work to get it back. I'm glad it was only this account and no others."

That's an optimistic explanation because your explanations were not personal, permanent, or pervasive. How do you feel about your future as a result of this explanation? Probably energized and hopeful.

See the difference? The event was the same. The only difference was the way you explained it to yourself. One set of explanations was optimistic, leading to energy and hope, while the other was pessimistic, leading to dejection and passivity.

Dr. Seligman has isolated optimistic behavior as one of the characteristics of successful people. Using various techniques he's developed, he predicted elections by analyzing each candidate's explanatory style. The most optimistic candidates often win elections.

The implications for you are awesome. If you can improve your explanatory style, and make it more optimistic, you'll create

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more positive energy and hope for yourself, no matter how difficult or negative the circumstances with which you must deal.

Learned optimism can be one of your most powerful self-management techniques. It's based on this powerful principle: Your thoughts influence your feelings and your actions, and you can choose your thoughts.

Learning to control and choose your thoughts is a learned skill, just like listening and closing. Every salesperson needs to gain some mastery over this essential competency.

2. By all means, ACT!

Not only do our thoughts lead to our actions, but our actions can create emotions, and those emotions can lead to our thoughts. Try this. Start laughing. No particular reason, just start laughing. Force yourself to laugh. Force yourself to laugh uproariously. Force yourself to laugh for a few minutes. When you're finally done, note how you feel. If you're typical, you'll feel pretty good. The laughter generated the feeling. And, since you

feel good, you're more likely to generate positive thoughts.

We can create feelings by acting, whether or not we feel like it. I'm told that marriage counselors will sometimes advise their patients to act like you are madly in love with your spouse for a few weeks. More often than not, they come back and report a deeper bond with their spouse. The action led to the feeling.

When it comes to sales, the same principle will work for us. By all means, act. Do something, anything, but get yourself out of your lethargy by acting. As you begin to do something, that action will stimulate you to feel better, which will stimulate you to think more positively, which will stimulate you to more positive action, which will stimulate you to more positive thoughts, etc. It's a cycle. Exactly the opposite of the depression cycle. Use this cycle to your benefit.

Learning to manage yourself is one of the core competencies of an effective, professional salesperson. And, I suppose, of a mature human being in any realm. The


sooner you gain this competency, the more successful you will be. ■

About Dave Kahle

Dave Kahle is a consultant and trainer who helps his clients increase their sales and improve their sales productivity. Dave has trained thousands of salespeople to be more successful in the Information Age economy. He is the author of over 500 articles, a monthly e-zine, and six books. *Ten Secrets of Time Management for Salespeople* was recently released by Career Press. You can join Dave's "Thinking About Sales Ezine" on-line at <http://www.davekahle.com/maillinglist.htm>. For more information, or to contact the author, e-mail cheryl@davekahle.com, visit <http://www.davekahle.com> or call (800) 331-1287

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New Solutions for Brushless Exciter—Rectifying Modules Reduce Downtime During Overhaul

As with any power system, age eventually takes its toll. In the case of the Cholla #3 unit at Arizona Public Service Company (APS) in Joseph City, Ariz., the 321-MVA generator was having problems with its brushless rotating exciter.

By John Demcko, Tim Vachon and George Ross, retired, Arizona Public Service; Andy Stendin, Larkin Power Components and Rich Schaefer, Basler Electric

The brushless exciter diode wheel consists of six diode modules per phase, with two “hockey puck” diodes in each module. Consequently, the complete three-phase diode wheel ring contains 18 modules and 36 hockey puck diodes, each with its own fuse and snubber capacitor. One problem was a power semiconductor failure causing a power fuse to open, which was indicated by the fuse expulsion pin. Subsequently, the fuse was replaced. Unfortunately, the root cause of the problem, a failed diode module, remained. This led to the failure of subsequent modules as fewer diodes carried the bulk of the current in that phase.

Additional problems arose with the snubber capacitors used for filtering. When the capacitor failed, the fuse opened. Although the fuse could be replaced, the failure of the capacitor rendered the module useless, since the capacitor was buried in an irreparable epoxy base.

When the power semiconductors failed and a repair was initiated during a scheduled outage, lead time of the replacement diode was unacceptably long. This jeopardized the scheduled startup date after the outage.

Sticking with the starter

The rotating exciter had other issues as well, most notably extremely time-intensive balancing. The original manufacturer's diode modules were often out of tolerance due to past repairs and a fairly loose weight tolerance. Balancing time was considerable, since numerous planes were involved to achieve satisfactory performance in mitigating vibration. For these reasons and

others, there was interest in reviewing the option of replacing the brushless exciter for a new static exciter that would work directly into the main generator field.

But a full static exciter option brought additional issues. This type of array would require brushes, brush rigging, collector rings and a means for air cooling. Power for the static exciter would need to be derived, and there was concern whether the station house transformer was of sufficient kVA to handle the additional static exciter load. Bus work sizing and concerns about harmonics were additional issues that needed to be addressed. If the power were taken from the generator output, then considerable engineering would be required to tap into the isophase bus. The demolition and rework would be extensive, and a location for the power potential transformer (PPT) and the static exciter control cabinet had to be selected.

At Cholla, space is at a premium on the turbine deck floor; hence, finding space for the lineup would be challenging. Budget estimates were in excess of \$2 million to modify the rotor and install and replace the brushless exciter with a new static exciter system. This was far more than the project could afford. Instead, the problem areas associated with the original brushless exciter system were evaluated and a plan was created to resolve them. The status of the old technology diodes is as follows:

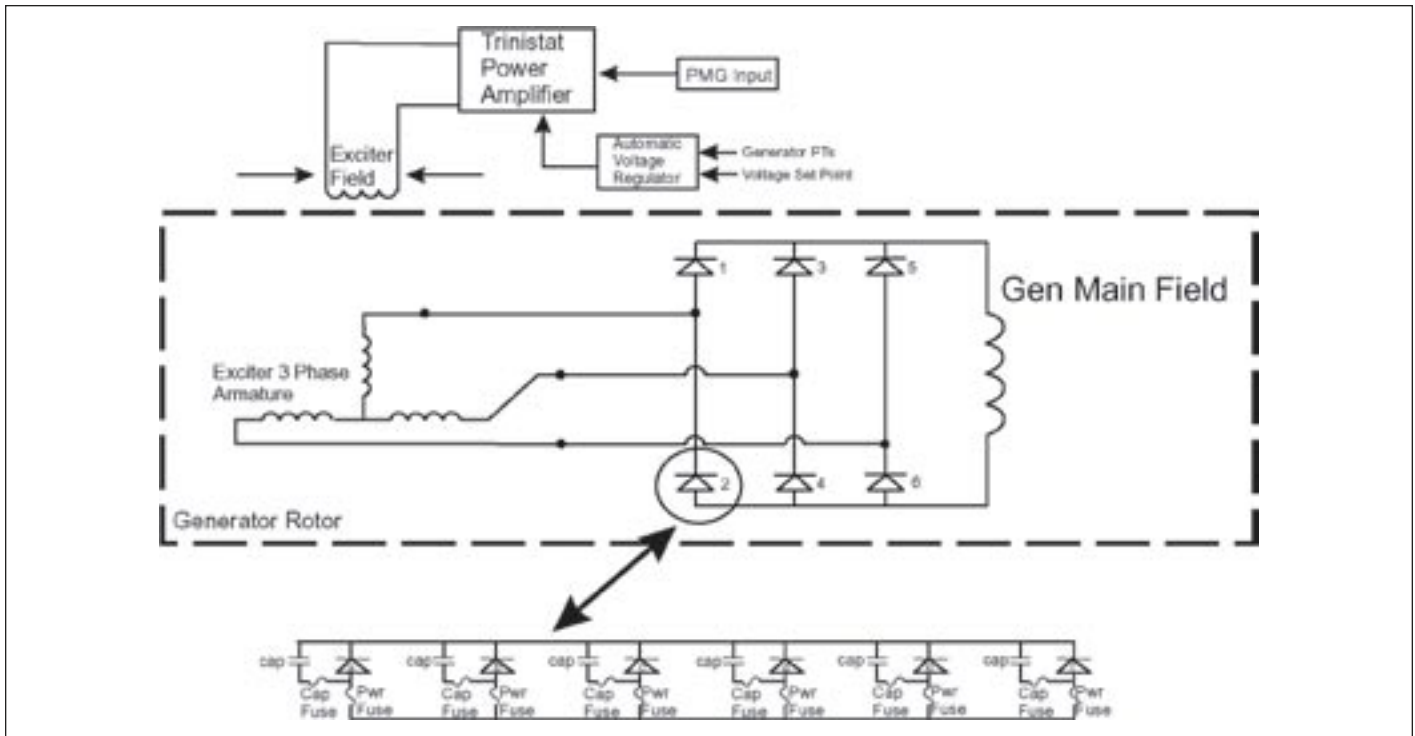
- Base block is the snubber capacitor and was deemed not replaceable. Entire module wasted for failed capacitor.
- Weak bus bars were subject to breakage.
- 10-32 screws for stand-offs.

- G11 isolation material in stand-offs.
- Modules delivered with different weights, requiring balancing after installation.
- Modules could not be made lighter.
- There was old-type wrapping material on the long bus bar.

The scope of the project included:

- Designing new, readily available and cost-attractive diode module replacements for the original OEMs.
- Replacing the existing WTA Trinistat with a new digital voltage regulator that was equipped with a power system stabilizer designed to work into the exciter shunt field of the brushless exciter.
- Reconditioning the brushless exciter's alternator and reevaluating the balancing problem to improve the time efficiencies.
- Developing more efficient methods to balance the entire diode wheel, alternator and permanent magnet generator (PMG).

When the costs were assembled, the dollars to improve the brushless exciter concerns and replace the voltage regulator were much more acceptable than buying and installing a new static exciter. The brushless rotating exciter and voltage regulator upgrade was estimated at \$300,000 versus \$2 million for a new static exciter installation. Of course, redesigning the diode modules for ease of maintenance and cost, and improved mechanical integrity injected a certain risk. But management concurred with the engineering team that the risk was both justified and acceptable.



The brushless exciter was the answer to issues related to the DC brush-type rotating exciter.

Rectifier module improvements

The engineering support of a consultant and manufacturer was the first step to evaluating the design of the existing rectifying modules on the diode wheel and examining the weaknesses of the old technology. Upon completion of the evaluation, new rectifier modules were redesigned using the latest material, components and manufacturing technologies to improve reliability and serviceability of the diode modules. Other important design criteria were to reduce the procurement and serviceability costs over the original devices and improve availability. Improvements with the new rectifier modules included:

- Replaceable snubber capacitor(s) are readily available.
- Thicker bus bars with center rib for reinforcement.
- ¼-28 screws for stand-offs to increase strength to reduce shear stress.
- G10 isolation material in stand-offs (better specs than G11) with higher tensile strength.
- Modules balanced from factory at ± 1 g, thus reducing balancing time.
- Modules can be made same weight as original or lighter, if required to reduce bearing fatigue.
- High voltage isolation material is cov-

ered with anti-abrasion weave on long bus bar.

- Higher PIV-rated power semiconductors.

Exciter improvements

With the new diode modules installed into the brushless exciter, advantages were significant, most notably the time taken to remove the old rectifying components and replace them with new assemblies. These new assemblies were lighter and more robust than the existing design.

With the old exciter diode assemblies, the replacement time was long and involved, due to weight discrepancies from one diode module to another. If a portion of an old rectifying module was defective, spare parts were an issue, with very little time available to disassemble and repair the assemblies. Issues such as selected fuses, diodes, capacitors, stand-offs and heat sinks would add to the problems of an outage when these parts were found to be defective. The capacitors in the assembly bases were not repairable, rendering them useless. Replacement of the selected diodes and fuses often resulted in damage to the stand-offs during disassembly. Foreign object damage to the phenolic stand-offs and fatigue cracks in the diode

heat sinks were not uncommon. The time and cost to repair these assemblies made replacement an attractive alternative to a new design.

Exciter reconditioning

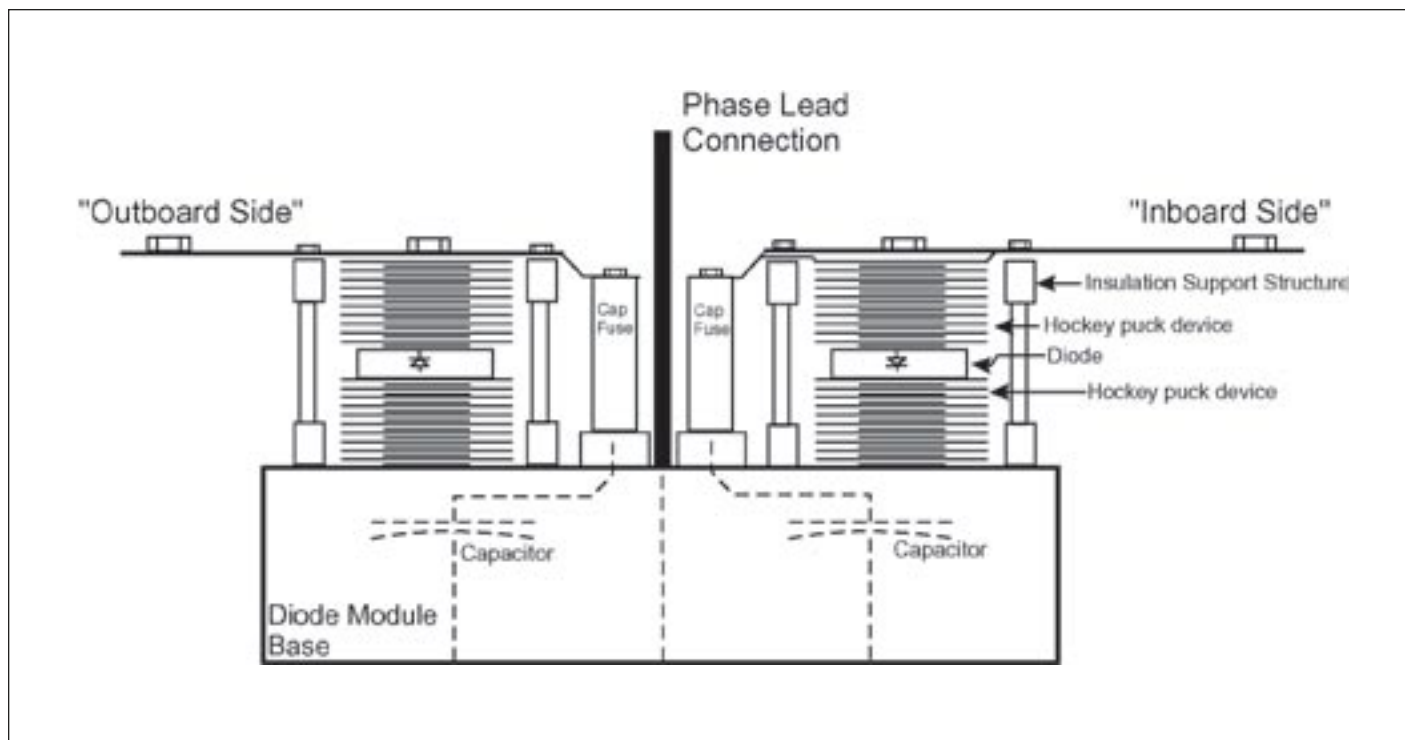
Another portion of the project was to recondition the brushless exciter. The alternator's rotating three-phase winding was rebanded, bearings were replaced and a power factor test was performed on the winding insulation to assure a sound AC power source when brought back to operation.

Exciter balancing

Field experience played a key role in addressing and minimizing the vibration issues of previous outages. These included the following:

- Low-speed balance of the assembly.
- Modified sling check to align overhung exciter to generator coupling #7 bearing loading.
- Modified PMG alignment.

Replacement of the diode assemblies required balancing of the exciter rotor. Historically, the exciter field balancing issue was a time-consuming process that APS wanted to avoid. The preferred method is a high-speed balance of the rotor assembly



Diode wheel bridge configuration.

at a facility to reduce or eliminate the need for field balancing. Overall time constraints and geographic distance to a high-speed balance machine resulted in slow-speed balancing the assembly at a local facility. The exciter utilizes seven balance-correction planes, fully accessible in the field. The field exciter rotor trim balance history was used to determine which of the seven planes were most responsive. The seven planes were reduced to four for slow-speed balancing. The diode wheel, exciter rotor and exciter cooling fan were selected as the most responsive planes. Two of the four planes were then selected depending on the unbalance condition measured. The static component on the diode wheel and exciter rotor was corrected, while any couple unbalance was corrected on the diode wheel and exciter cooling fan.

The match weighing of the new diode assemblies allowed for no variation in diode replacement. The old assemblies were out of tolerance due to past repairs and part replacement that did not take the time to properly match-weigh the assemblies.

The sling check historically used the bearing end of the exciter, supported in a sling while the generator end coupling bolts were selectively torqued, to control run-out on dial indicators on the exciter bearing journal. The time-consuming process and inaccuracies were reduced by

adding a liner-bearing support similar to those used on soft-bearing balance machines. The support, with the addition of a proximeter probe to measure displacement, allowed a more accurate correction of rotor run-out at the coupling.

The exciter journal bearing alignment was modified to compensate for the overhanging exciter rotor mass relative to the generator. The bearing loading prevented a lightly loaded bearing that contributed to the vibration of the rotor.

The PMG alignment utilized a truth diameter machined on the PMG housing and a temporary shaft on the exciter rotor to mount a laser alignment tool. The laser alignment allowed real time measurement of correction shims added to the PMG, significantly reducing alignment time. The tachometer shaft was eliminated and replaced with a temporary shaft used only during assembly. The tachometer signal was replaced, utilizing the output of the PMG signal for speed signal. The tachometer shaft also eliminated the extension shaft that had caused vibration issues in the past.

Happy with the decision

All of the goals established for the Cholla #3 unit were met. The best decision proved to be keeping the brushless rotating exciter, while replacing the volt-

age regulator, and simply addressing the issues surrounding it. The money saved by keeping the rotating exciter was substantial compared to the costs of retrofitting to a full-static exciter, and the reliability of the machine with the new parts has increased substantially. Where unscheduled outages due to failure of an equipment device can cause severe cost penalties, utilities are challenged to provide the most economical means to achieve the greatest reliability of the machine and system.

For more information on diode rectifier module replacements, contact Rich Schaefer at Basler Electric: richschaefer@basler.com, (618) 654-2341x757. ■

Reprinted with permission from Consulting-Specifying Engineer's 2006 On-Site Power Supplement.

A History of the Brushless Exciter

The brushless exciter was the answer to issues related to the DC brush-type rotating exciter. The problem of commutator wear and replacement issues regarding brush maintenance for the DC exciter and generator main field all focus on the need to improve the process of getting DC power into the field of the generator.

In the late 1960s, power semiconductors became a mature product and gained favor for use in rectification circuits for converting AC to DC. Power-rectifying diodes became common for use on rotating exciters. The brushless exciter is an AC generator with a stationary field winding and a rotating three-phase AC output winding. AC output is rectified by diodes to convert AC to DC into a three-phase full-wave bridge. The diodes are located on a steel ring or diode wheel on the outboard side of the rotating exciter and are configured as a three-phase full-wave rectifier bridge. The output of the rectifier diode wheel is connected via insulated bus bar through the center of the shaft to the main field of the generator. Depending upon the amount of DC current required by the field of the generator, the AC exciter may be quite large to handle the rotor field requirements of 2,000-5,000 DC amps. The large field-current requirement prompted the need to have many power semiconductors connected in parallel for each phase to handle the rotor requirements.

In addition to the power diodes, capacitors were placed across each power semiconductor to minimize switching transients during the time when the diodes were commutating in each cycle. The capacitors provide a filtering to reduce the magnitude of the switching transients during diode commutation. These devices are called snubber capacitors. Figure 2 illustrates a typical application where the three-phase output of the AC exciter is rectified by power diodes for each phase. The cutaway view shows multiple sets of power diodes in each phase, along with the commutating capacitor across each diode.

The age of the diodes, the combined effect of centrifugal stresses imposed upon the devices due to spinning at 3,600 rpms and induced transients from the stator eventually cause increased rates of semiconductor failure. However, the failure of one diode does not force an outage, since additional power semiconductors are arranged in parallel. ■



Match weights of the 18-diode module reduced the exciter's balancing time. Photo courtesy of Basler Electric.

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EGSA Names David I. Coren Scholarship Recipients for 2007-08

The Electrical Generating Systems Association (EGSA) has named 9 students as recipients of the David I. Coren Memorial Scholarship Awards for the 2007-2008 academic year. The competitive, merit-based scholarships are awarded to qualified students who plan on pursuing a career within the On-Site Power Generation industry. In addition to their career focus, applicants must be full-time students and have a declared major directly related to On-Site Power Generation. In addition, they must maintain a minimum 2.8 Grade Point Average (GPA).

EGSA launched the David I. Coren Scholarship Program in 2002 to address a number of needs, including:

- generate student interest in On-Site Power careers;
- provide financial assistance to those students who were found to be qualified and deserving;
- take aim at the personnel shortages being experienced at every level within the On-Site Power industry;
- raise public awareness of the On-Site Power Generation industry and the positive impact it has made on our society.

About David I. Coren

The David I. Coren Scholarship Program was established to provide financial assistance to students who plan to seek employment in the On-Site Power Generation industry after they have

successfully completed their studies. The Scholarship Program was named after David Coren to commemorate his exemplary leadership as well as his efforts and many contributions to advance EGSA.

David joined both Zenith Controls and EGSA in the early 1990's. He became Chairman of EGSA's Convention Planning Committee in the mid 1990's, and his strong leadership led to many exciting convention programs. In 1999, EGSA recognized his contributions to the Convention Program Planning Committee by honoring him with the William Timmler Award.

David held several executive positions at Zenith Controls including Manager of Business Development, and Vice-President. He became President of Zenith in the late 1990's and held that position until the company was sold to General Electric at the end of 1999. David's integrity, honest and direct approach, and caring attitude earned him the respect of all the employees at Zenith, as well as throughout our industry. David passed away in the fall of 2000, leaving his wife and two young children, and also leaving a lasting legacy of EGSA leadership.

For more information about the David I. Coren Scholarship Program—including an application and informational brochure—visit the EGSA web site at www.EGSA.org. ■



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CHRIS M. MCFARLAND*Gonzaga University*

My name is Chris McFarland, and I live in Spokane, WA with my wife Becky, our son Garrick and our daughter Bridey. I am going into my last year of college and—looking back—I am not sure how I got here! The last four years have been the most challenging and rewarding years of my life. I have raised two beautiful children, maintained a cumulative GPA of 3.7 at Gonzaga's school of engineering, and worked at Kim Hotstart Mfg. the entire time. The secret to my success is my support system. My wife has been absolutely incredible at making sure I am taken care of during all of the tough times. Kim Hotstart has allowed me to work a flexible schedule and even given me the chance to prove myself as an engineer while EGSA has been kind enough to reward me with another scholarship. All of these things combine to create a support system that will carry me through the last year of college—thank you all!

**RANDAL B. CARLTON II***University of Massachusetts - Amherst*

My name is Randal B. Carlton II, or Randy for short, and I live in Southwick, MA. I attend the University of Massachusetts-Amherst where I am pursuing a degree in computer systems engineering along with a minor in mathematics. I maintain a GPA



of 3.4, and I expect to graduate in May 2008. For the upcoming year, I received the Ermonian Scholarship from the College of Engineering and will be working as a teaching assistant. On campus, I am a member of IEEE and sit on the board of Eta Kappa Nu (HKN), the honor society for Electrical and Computer Engineers. This summer I am working at a startup technology company and am continuing work with Governors America Corporation. In my free time, I love to contribute my time to charities and organizations and participate in charity events such as American Cancer Society's Relay for Life and Jay's Run.

GLEN ELLER*Vanderbilt University*

My name is Glen Eller. I am married with three children and live in Cross Plains, Tennessee, located north of Nashville. I have been accepted to Vanderbilt University to complete my Bachelor's degree in Electrical Engineering. After graduation in June 2009 I hope to find employment related to emergency power generation. I plan to work for a generator or switchgear manufacturer designing the control systems required to operate their equipment. I aspire to work in a research and development laboratory involved in designing a more efficient source of electrical power. In my spare time, I enjoy canoeing and gardening with my family.



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David I. Coren Memorial Scholarships

MATTHEW B. FORBES

Pennsylvania College of Technology

Hi, I'm Matthew "Matt" Forbes. I live in Mifflinburg, PA. I graduated from Mifflinburg Area High School with a GPA of 3.77 and ranked 35 of 168. I attend the Pennsylvania College of Technology's two-year Electric Power Generation program. Some of my hobbies are camping, riding all-terrain vehicles (ATV) and boating. My ultimate career goal is to be successful in college and get a good job in the power generation field. I've been fortunate to receive a scholarship from Caterpillar as well as this award from EGSA. I'd like to thank the Association for presenting me with this scholarship; it will be a great help in furthering my career.



TREVOR R. STEFFLER

Idaho State University

My name is Trevor Steffler and I attend Idaho State University in Pocatello, ID. I plan on graduating from ISU in 2009 with a Bachelor of Applied Technology in Instrumentation Technology with an emphasis in Business as well as an Associate of Applied Science Degree in Energy Systems Technology. I currently hold an Associate of Applied Science degree in Instrumentation Technology and maintain a GPA of 3.8. I go to school full time and work part time for the Instrumentation Department at ISU as a tutor/lab assistant as well as working on the weekends on the family farm where we raise potatoes and grain. My ultimate career goal is to someday build a company that directs its goals to meet the green On-Site Power Industry's needs. I would like to thank my family for their support and for EGSA for giving me this opportunity.



CLIFFORD (GLENN) MILNER

Clemson University

I am currently a junior in mechanical engineering at Clemson University with a 3.93 GPA, and am co-oping at General Electric in Greenville, SC. My interests are becoming fluent in Spanish, lifting weights, running, and anything to do with sports. At General Electric I worked in Gas Turbine conceptual design where my group developed new products and technology. Next fall I will be working for Wind Turbine conceptual design where I will help design General Electric's next line of Wind Turbines. I believe that Wind Turbines are a promising eco-friendly energy solution and I am very excited to work in this emerging technology. I hope to continue working in the Wind Turbine industry after getting my degree in December 2009, and to see the business expand.



DANIEL G. KASPRZAK

Fox Valley Technical College

After working in the automotive industry, I decided to return to school in August 2006, to start my two year Associates Degree in Diesel Technology. Currently, I only have one more semester left for final completion of my degree and I have been working part time as a Heavy Equipment Technician at Murphy Concrete and Construction. I learned that Fabco "Caterpillar" was making plans to build a first of its kind school right here in Oshkosh, WI, and I applied to the program with a set goal of obtaining a 1 year Associates Degree in Electrical Power Generation. With my acceptance letter in hand from Fabco, I applied for and was excited to receive the EGSA scholarship. It is a great honor to accept the David I. Coren Memorial Scholarship, and I would like to thank my instructor Joe Berhausen and my family for all of their support. Without people who believed in me, I would not be where I am today.





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JOHN D. CHRISTIAN III*Ohio Technical College*

My name is John D. (J.D.) Christian, III and I am from Middletown, VA, located in Virginia's beautiful Shenandoah Valley. I am an avid outdoorsman and enjoy hunting, fishing, and four-wheeling. In July 2007, I graduated from the On-Site Power Generation Program at Ohio Technical College in Cleveland, OH, where I was an Honor Roll Student graduating 7th in my class with a 90% G.P.A. This is my second diploma from Ohio Tech – in March 2007 I graduated from the Auto Diesel Master Vehicle Program, an 18-month automotive/diesel technology program.



I have worked part-time for three years with Burcham's Garage in Winchester, VA. I am currently seeking full-time employment in the generator/diesel field and would welcome contacts. My ultimate career goal is to have my own business servicing heavy equipment and generators. My thanks and appreciation to EGSA for the scholarship—it is a great financial help; and also to my OPG teacher Mox Eggert, for giving me a wealth of knowledge and for being one of the most skilled teachers from whom I have ever had the pleasure of learning.

DAVID M. VANDER ARK*North Dakota State University*

My name is David Vander Ark, and I live in Fargo, ND. In spring 2007, I graduated from Minnesota State Community and Technical College with highest academic honors from the construction electricity program. At graduation, I had maintained a 3.9 GPA and participated in league sports organized by fellow students. While in school, I work part time installing equipment in industrial locations for KVA Engineering of Corcoran, MN. I am very eager to continue expanding my knowledge of electricity and have enrolled in the electrical engineering program at North Dakota State University located in Fargo. I am dedicated to preparing myself for a career in On-Site Power Generation.



When I am away from my studies I enjoy the outdoors and time with my family. I participate in many sports including windsurfing, kayaking, snowmobiling, waterskiing and much more. I enjoy constantly challenging myself so I have recently decided to take up golf. When I find time, I like to tinker with my old truck, a 1973 Chevy Blazer Convertible. This is a full restoration project that I hope to complete someday. However, as I remember a man once said, "Life is a journey, not a destination." I have found it is the journey that is most fulfilling.



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Whether you are a newcomer to the On-Site Power Generation Industry or a veteran already working with power generation technology, EGSA's On-Site Power Generation Schools offer you comprehensive information you won't find anywhere else.

While newcomers receive an outstanding introduction to On-Site Power Generation Systems, veterans tell us that our schools provide a great and very meaningful review of critical material. Everybody benefits by getting the most up-to-date information available that is presented by seasoned professionals from some of the biggest companies in the industry.

From voltage regulators to transfer switches to sizing and service, we cover it all in a three-day event. And every student receives a copy of EGSA's 597-page *On-Site Power Generation Reference Book* (a \$225 value) and extensive handout materials.

What's more, you can extend your learning with two extra days of optional sessions that cover prime mover fundamentals, basic electricity, troubleshooting, specifications and bid documents and multiple generator configurations.

With our Continuing Education Unit program, you can earn up to 3.1 CEUs. By earning CEUs you can not only take pride in your accomplishments and knowledge, our CEUs might give you an advantage during your next performance review and your employer will know that the investment in your training has been money well spent. Plus, CEUs may help maintain licenses and professional society membership. When you register for the school, be sure to sign up to take the Continuing Education tests.

For complete information on EGSA's On-Site Power Schools—including a schedule and registration materials—and full details on our Continuing Education program, visit us online at www.EGSA.org.

Electrical Generating Systems Association

1650 South Dixie Highway, Suite 500

Boca Raton, FL 33432

Email us at e-mail@egsa.org

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Application for Membership

ELECTRICAL GENERATING SYSTEMS ASSOCIATION

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EGSA's mission is to bring together representatives of the various segments of the On-Site Power Industry, to learn, share ideas and experiences, advance the science of On-Site Power generation, improve performance and profitability of members, and the quality of service to power users.

1. Contact Information

Please type or print all information in upper and lower case (NOT ALL CAPS!)

Company _____
Address _____
City _____ State/Province _____
Zip/Postal Code _____ Country _____
Phone _____ FAX _____
Official Representative _____ Title _____
Representative's E-Mail _____ Company's Web Address _____
How did you hear about EGSA? ☐ Web site ☐ Powerline magazine ☐ Colleague ☐ POWER-GEN ☐ Other _____
Why are you joining EGSA? ☐ Certification Program ☐ CEU Program ☐ Power Schools ☐ Buyers Guide Listing ☐ Other _____

2. Member Classification

Read the Membership classifications below and check the box that describes your firm's classification.

I. FULL MEMBERSHIP

- ☐ MF **Manufacturer Membership**
Any individual, sole proprietor, partnership or corporation seeking membership must apply for a Full Membership as a manufacturer if they meet one or more of the following criteria:
1. They manufacture prime movers for power generation.
 2. They manufacture generators or other power conversion devices producing electricity.
 3. They manufacture switchgear or electrical control devices.
 4. They manufacture or assemble generator sets, UPS systems, solar power, hydropower, geothermal, or any other power production or conversion system including related components or accessories for national or regional distribution.
 5. They are a wholly owned subsidiary of a firm which qualifies under rule one through four.
- ☐ DD **Distributor/Dealer Membership**
Any individual, sole proprietor, partnership or corporation actively engaged as a distributor or dealer for products listed under Manufacturer Membership may apply for Full Membership as a Distributor/Dealer. If an organization qualifies under Manufacturer Membership, it is not qualified under this section.
- ☐ MR **Manufacturer's Representative Membership**
Any individual, sole proprietor, partnership or corporation actively engaged in the representation of products listed under Manufacturer Membership may apply for Full Membership as a Manufacturer's Representative. If an organization qualifies under Manufacturer Membership, it is not qualified under this section.
- ☐ EM **Energy Management Company Membership**
Any individual, sole proprietor, partnership or corporation engaged in energy management, including Energy Service Companies (ESCOs), Independent Power Producers (IPPs), Integrators, Aggregators, and other similar enterprises may apply for Full Membership as an Energy Management Company.
- ☐ **Associate Full Membership** (mark appropriate category at right)
Any individual, sole proprietor, academic institution, student, partnership or corporation meeting the requirements of Associate Regular Membership may apply for Full Membership at their option to enjoy the privileges of Full Membership, including the rights to vote and to serve on EGSA's Board of Directors. Initiation fees and annual dues will be assessed at the existing non-manufacturers' Full Member rates.

II. ASSOCIATE REGULAR MEMBERSHIP

- ☐ AA **Trade Publication Membership**
Any trade publication dealing with the electrical generating systems industry or its suppliers may apply for Associate Membership—Trade Publications.
- ☐ AB **Trade Association Membership**
Any trade association made up of individual or company members sharing a common interest in the electrical generating systems industry may apply for Associate Membership—Allied Associations.
- ☐ AC **Engineer Membership**
Any consulting or specifying engineer may apply for Associate Membership—Engineer. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category.
- ☐ AD **End-User Membership**
Any individual employee of a company who owns or operates electrical generating equipment and/or related switchgear or components, whose responsibility to his employer includes planning, design, installation, supervision, or service of such equipment may apply for Associate Membership—User. Membership may either be held in the employer's name or individual's name under this classification. Individuals whose employer qualify as a Full Member, as described in the Full Membership section, do not qualify for this category.
- ☐ AE **Service Membership**
Any individual, organization or academic institution that offers services such as research, testing or repair to the electrical generating systems industry may apply for Associate Membership—Services. Membership may either be held in the individual's name or the organization's name under this classification. Individual companies whose employer or parent organization qualifies as a Full Member, as described in the Full Membership section, do not qualify for this category.
- ☐ AG **Educational Institution Membership**
Any postsecondary vocational-technical school or college offering on-site power generation-related instruction may apply for Associate Membership—Education Institution.
- ☐ AR **Retiree Membership**
Any individual who retires from a member company may apply for Associate Membership—Retired. This classification does not apply to any individual who is employed more than 20 hours per week.
- ☐ AF **Student Membership**
Any individual currently enrolled at an academic institution may apply for Associate Membership—Student.

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☐ YES ☐ NO Date: _____
Name (Print) _____
Signature _____

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Amount Paid \$ _____ Check Number _____
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Mentor Assigned _____ Committee Interest _____

Dues Schedule (Use for Section 3)

| | Annual Dues | Initiation Fee | TOTAL |
|----------------------------------|--------------------|-----------------------|--------------|
| Manufacturer..... | \$825 | \$200 | \$1025 |
| Energy Management Companies..... | \$825 | \$200 | \$1025 |
| Distributor/Dealer..... | \$285 | \$100 | \$385 |
| Manufacturer's Rep..... | \$285 | \$100 | \$385 |
| Regular Associate Member..... | \$200 | \$100 | \$300 |
| Full Associate Member..... | \$285 | \$100 | \$385 |
| Retiree Member..... | \$90 | \$0 | \$90 |
| Student Member..... | Complimentary | \$0 | \$0 |

NOTE: A FULL 12-MONTH DUES PAYMENT MUST BE RECEIVED WITH THIS APPLICATION. The Association's Membership Year is January 1 through December 31. Dues payments that extend beyond the first Membership Year will be applied to the second year's dues.

FULL PAYMENT MUST BE RECEIVED WITH APPLICATION.**3. Membership Dues** (Please fill in the appropriate TOTAL amount from the above dues schedule.)

Membership Dues \$ _____

Membership Plaque (optional)** \$ 39.95**

On-Site Power Reference Book (optional)** \$ 125.00**

Florida Residents: Add 6.5% Sales Tax to ** items \$ _____

Continental US Residents add \$5 shipping/handling to **items. \$ _____

Non Continental US Residents should call EGSA Headquarters for shipping charges for **items. **TOTAL** \$ _____

4. Payment Method (Payable in US\$ drawn on U.S. bank, U.S. Money Order, or American Express)

☐ Check # _____ Amount \$ _____

☐ Money Order

☐ Mastercard ☐ Visa ☐ American Express

Card # _____ Exp. Date _____

Signature: _____

Print Name: _____

5. Products/Services Please describe the nature of your business (50 words or less, NOT ALL CAPS) If you are a Manufacturer's Representative or Distributor, please indicate which manufacturers you represent and/or distribute for:

Available Codes:

| | | |
|---|---|---|
| 01 ---Batteries/Battery Chargers | 11 ---Generators/Alternators | 21 ---Switchgear and Transfer Switches (Automatic or Manual), Bypass Isolation Switches, and/or Switchgear Panels |
| 02 ---Control/Annunciator Systems | 12 ---Governors | 22 ---Trailers, Generator Set |
| 04 ---Enclosures, Generator Set | 13 ---Heat Recovery Systems | 23 ---Transformers |
| 05 ---Engines, Diesel or Gas | 14 ---Instruments and controls, including meters, gauges, relays, contactors, or switches | 24 ---Uninterruptible Power Supplies |
| 06 ---Engines, Gas Turbine | 15 ---Load Banks | 25 ---Vibration Isolators |
| 07 ---Engine Starters/Starting Aids | 16 ---Motor Generator Sets | 26 ---Voltage Regulators |
| 08 ---Filters, Lube Oil, Fuel or Air | 17 ---Radiator/Heat Exchangers | 27 ---Wiring Devices or Receptacles |
| 28 ---Fuel Cells | 18 ---Relays, Protective or Synchronizing | |
| 03 ---Fuel Tanks and Fuel Storage Systems | 19 ---Silencers/Exhaust Systems/Noise Abatement | |
| 09 ---Generator Laminations | 20 ---Solenoids | |
| 10 ---Generator Sets | | |

Enter codes here:**Products sold:** _____**Products rented:** _____**Products serviced:** _____Do you buy AND sell equipment? ☐ Yes ☐ NoDo you manufacture packaged equipment? ☐ Yes ☐ No**6. Sponsor(s):** A "Sponsor" is an EGSA Member who interested you in filling out this application. It is not mandatory that you have a sponsor for the Board to act favorably on this application; however, if a Member recommended that you consider membership, we request that individual's name and company name for our records.

Sponsor Name _____ Company Name _____

7. Official Representative's Authorization

Signature _____ Date _____

Phoenix Products Names GM

Robert Lytle has been named general manager of Phoenix Products. Lytle has over 20 years experience in manufacturing, project management and sales, most recently as Southeast regional vice president of Wabtec Corp.

Lytle joined Wabtec in 1994, during which time he supervised the building and startup of a 50,000 square foot manufacturing facility, directed sales and marketing efforts and supervised southeast region sales. As general manager of Phoenix Products, Lytle's responsibilities will include oversight of daily operations, with the goal of increasing overall sales revenue and manufacturing capabilities.

Phoenix Products is a subsidiary of Ring Power Corporation, the Central and Northeast Florida Caterpillar dealer. Since 1991, Phoenix Products has provided integrated fueling system services and generator packaging including engineering design and product manufacturing. Visit *PhoenixProds.com* for more information.

AT&T chooses Saft to Supply Batteries for Network Support

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Saft has developed its NCX battery technology specifically for modern telecommunications networks that utilize a large number of remote network terminals in the digital fiber loop. These terminals are typically without environmental control and several hundred thousand are today installed in suburban and small community locations in many parts of the world.

Saft is a world specialist in the design and manufacture of high-tech batteries for industry. Saft batteries are used in high performance applications such as industrial infrastructure and processes, transportation, space and defense. For more information, visit Saft at *www.saftbatteries.com* ■

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Stay on Top of Your Game with EGSA's Electrical Generator Systems Technician Certification Program

Think things move pretty fast in today's business world? Think how fast they'll be moving one, five or even 10 years down the road. That's why you need every advantage to stay on top.

It's no secret that technology is becoming more complex—not less—and that makes today's On-Site Power Generation System a lot more expensive. End-users—your customers—don't want just anybody with a basic knowledge of mechanics to install and maintain their equipment. They want to be confident that all work has been performed by qualified personnel. Suppliers want assurance that skilled technicians are performing maintenance and repairs to guard against unnecessary returns or warranty repairs.

As Good as Your Word

In the past, your word was the only assurance that your technicians are skilled and knowledgeable. But now, through EGSA's Electrical Generator Systems Technician Certification Program, there is a way that you can back up those words with objective evidence of your technicians' proficiency.



EGSA offers you a big advantage: For the first time in our industry, we have an objective and accurate way to determine generator technician proficiency. That means that the same standards will be used to measure the skills and knowledge of technicians from Maine to Manitoba and Mexico. Yes, Manitoba and Mexico! EGSA has determined that there is no reason why the test could not be fairly applied to any NAFTA technician.

What are the Benefits?

For the Employer, certification helps ensure that your technicians have the critical knowledge and skills to succeed in their jobs. And everyone will be comfortable knowing that your certified technicians' expertise has been confirmed by the industry organization through a program that was developed by a university. Encour-

aging and helping your technicians become certified signifies your commitment to the highest of standards. Plus, it lends an added level of credibility to your firm and can sharpen your competitive edge. Employing certified techs will promote customer satisfaction and you won't have to be shy about offering assurance that your techs are qualified. Certification can also help you select potential new hires, analyze job performance, evaluate employees and motivate technicians to enhance their skills and knowledge.

Think about the message that certification sends to those with whom you do business. Why would anyone want a technician who isn't certified performing critical maintenance or repair tasks? Employing certified technicians gives you an added tool with which to market your business.

As our members have said, "We've seen too many backyard mechanics damage expensive equipment. This program will provide credibility for my company and will help build pride and a commitment from technicians to be the best."

For the Technician

Certificate holders benefit too. Certification shows employers, clients, and associates that you are committed as a professional. It provides recognition of your knowledge and skill, shows your commitment to your profession and can help with job advancement. Certification is a mark of excellence that you carry with you everywhere you go.

Acquiring certification indicates that you have the knowledge and proficiency required to perform as an Electrical Generating Systems Technician professional. Becoming certified can increase your salary, enhance your skills, and make your job more satisfying.



Certification helps ensure that your technicians have the critical knowledge and skills to succeed in their jobs.

The Certification Test

EGSA collaborated with Ferris State University to develop the certification test and program. Through a scientific process, our panel of technical experts identified 12 duty areas (such as “Basic Electricity”) and 61 tasks (such as “demonstrate knowledge of AC electrical theory”) within the duty areas. The duty areas and tasks were ranked and rated in terms of their relative importance, the frequency with which a task is performed, and skill level (i.e. Senior/Expert; Intermediate; and Entry Level.) All this data was combined to develop the certification test that was then statistically validated through a pilot test taken by generator technicians from across the United States.

Who can take the Test?

There are no pre-qualifications for taking the EGSA Certification test. We recommend three or four years of field experience before taking the test. Technicians who have had formal education in On-Site Power Generation (a degree or certificate from a technical school or community college) may need less field experience. Those who pass the test will have a comprehensive knowledge of basic electricity, the functions of a gen-set’s mechanical and electrical components, the interactions and relationships among components and an understanding of various elements of the installation, service, maintenance, and repair of gen-sets and On-Site Power Generation Systems.

CERTIFICATION TESTING COVERS:

- Automatic Transfer Switches
- Communication & Documentation
- Engine Generator Instrumentation & Controls
- Multiple Generator Switchgear & Controls
- Troubleshooting System Problems
- Auxiliary Support Systems
- Basic Electricity
- Prime Movers
- Governors
- Voltage Regulators
- Generators/Alternators

Use the Study Guide to Prepare!

Use of the program’s Study Guide is an excellent way to help techs prepare for the test and should clearly indicate if they are ready to take (and pass) the certification exam. In addition to useful formula pages, the guide contains almost 200 multiple choice practice questions that cover all parts of the certification test. In addition to identifying the correct answer, the guide also indicates in most cases why a particular choice is correct

and why the others are incorrect. The Guide also identifies resource material where techs can get additional or more in-depth information about a given topic.

Need more information? Visit www.egsa.org to find extensive and detailed information about the certification program. Or contact EGSA Director of Education George Rowley via e-mail at g.rowley@egsa.org.



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Certified status is an indication that an individual has completed a combination of defined education, experience or examination requirements. However, Certification is not a guarantee or assurance of the competence or ability of any particular individual. Further, given the rapid changes in the field, the Electrical Generating Systems Association cannot warrant that the Examination and other Certification materials will at all times reflect the most current state of the art.

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Generator Field Technicians

TAW, Inc. is searching for experienced Generator Field Technicians in Tampa, FL. Duties include: inspections, repairs, services and start-up of generators and ATS. Troubleshoot Generators and automatic transfer switches. E-mail resume to ellen.donegan@tawinc.com. Fax (813) 612-2609. AA/EOE. DFWP. Check out our web site www.tawinc.com.

SERVICE MANAGER WANTED

Contact Rodney Weimer
Gillette Generators
1340 Wade Dr., Elkhart, IN 46514
RWWeimer@gillettegenerators.com

Generator Field Service Technician

Penn Power Systems a leader in the Power Generation Industry is currently accepting resumes for Field Service Technicians for our Central and Western Pennsylvania territories. Candidates will have no less than 3 years experience in either the Electrical or Mechanical fields. With a focus on diesel, gas, and propane engines. An understanding of relay and solid state logic is a must. Please forward your resume to Jason Sally, Human Resources, email: jsally@pennnda.com or fax (215)335-5013 EOE M/F/D/V

EMERGENCY POWER SYSTEM SPECIALISTS

Generator Technician—Experienced

Emergency Systems Service Company in Quakertown, PA, a leading provider of emergency generator sets, has an immediate opening for a technician with a minimum of three years diesel engine/generator set background/experience. Responsibilities will involve troubleshooting, repair and the planned maintenance services of generator sets and peripheral equipment. A neat appearance, clean driving record and good people skills are required. We offer a highly attractive compensation with an outstanding benefits package. A company vehicle and additional training provided. If you are interested in becoming part of our team, please call (215) 536-4973, ext. 25.

Generator Technician—Apprentice

Emergency Systems Service Company in Quakertown, PA, a leading provider of emergency generator sets, has an immediate opening for a person with a strong mechanical/electrical background interested in a career in the power generation service field. Responsibilities will involve minor troubleshooting, repair and the planned maintenance services of generator sets and peripheral equipment. A neat appearance, clean driving record and good people skills are required. An outstanding benefits package, company vehicle and additional training provided. If you are interested in becoming part of our team, please call (215) 536-4973, ext. 25.

Mechanical Engineer

Miami based Generator Set manufacturer with very competitive benefits and compensation package has an immediate need for a Mechanical Engineer, the applicant will design, develop and test all aspects of mechanical components, equipment and machinery. The applicant will apply knowledge of engineering principles to design power generation products such as engines, controls, machines, etc. Desired qualifications include BSME along with 5 to 10 years of progressive experience designing power generation units. Applicants please submit your resumes to: francesa@tradewindpower.com or fax to 305-593-9447.

Outside Generator Service Sales Representative

TAW Inc is seeking experienced Outside Service Sales Representative in Fort Myers and Pompano Beach, FL. The qualified candidate will sell generator repair services to new and existing clients. Will travel to customer sites within Fort Myers and Pompano Beach and the surrounding areas. Will prepare quotes and proposals. Prior technical knowledge and experience in selling generator products and/or industrial sales desired. E-mail resumes to ellen.donegan@tawinc.com or fax 813-217-8076. AA/EOE. DFWP. Check out our web site www.tawinc.com

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Sales and Application Engineers

- will provide technical support to the sales managers and customers, actively participate with the sales team at customer facilities, attend trade shows, and provide phone and on-site startup assistance. An engineering BS is required, industry experience beneficial – will entertain recent college grads with the right background, Spanish language skills preferred as this person will interface with Mexico and other Central American customers.

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Please contact Mr. Steve Evans on:
Tel: +1 (970) 530-2261 or e-mail: see@deif.com

DEIF Incorporated, 2057 Vermont Drive
Fort Collins, CO 80525, USA



Engine/Generator Mechanic

Seasoned Engine/Generator Mechanic wanted for northern Virginia area. Flexible work schedule with growing company. 20 years experience preferred. Candidates must have firsthand knowledge of traffic dynamics in the No-VA, MD and DC area and be able to arrange their workday to minimize lost time in traffic while completing their assigned work in a high-quality, timely manner. Send introductory letter and resume to customerservice@gentune.com.

Generator Set Sales/Service

Experienced sales/service engineer needed by southern California company to sell engine generator sets.

Please respond to J.Kellough@EGSA.org
(Reference PLND06JB-1).

Generator Field Technicians

Loftin Equipment Co. is searching for experienced Generator Field Technicians in Las Vegas, NV. Job responsibilities include preventive maintenance, repairs and start up of generators and ATS switches. Send your resume to Fax (602) 233-2620.

EGSA Job Bank Guidelines—EGSA will advertise (free of charge) EGSA Members' job openings each issue in the Job Bank. Blind box ads using the EGSA Job Bank address are available upon request. Companies who are not members of EGSA may utilize the Job Bank for a \$300 fee. Please note that company logos may be included for an additional fee. Please send your classified ad (limited to about 50 words) to: **EGSA Job Bank**, 1650 S. Dixie Hwy, Suite 500, Boca Raton, FL 33432. Or, send it via e-mail it to: J.Kellough@EGSA.org

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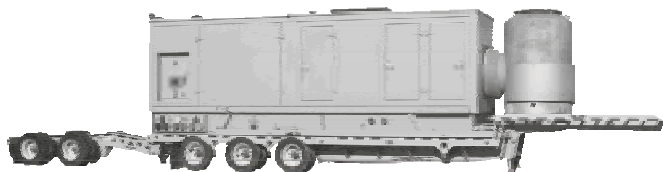


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AltaStream Power Systems (MF)
Delta, BC Canada
(604) 940-9143 Fax: (604) 940-9145
Contact: Allan McLeod, VP
Business: Purchase/vent new & used generator sets; service and parts; design and build unique power projects (i.e., co-generation, alternative energy); packaging: enclosures, containers, tanks.

Dixon Electrical (AE)
Milledgeville, GA
(478) 696-2372
Contact: Coby Dixon, Owner
Business: Electrical contractor for small commercial, industrial and high-end residential.

Generators of Houston, L.P. (DD)
Houston, TX
(713) 812-7285 Fax: (713) 290-9285
Contact: Louis Giddens, Owner
Business: Dealer for Cummins Onan, Generac, Guardian, Kohler, John Deere, Yanmar and Briggs and Stratton.

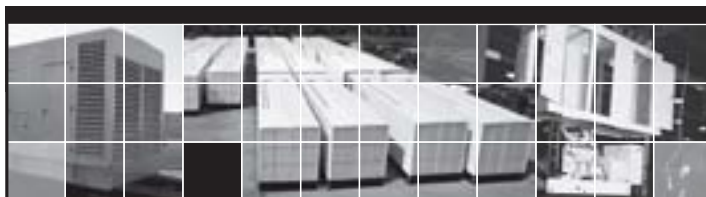
Heinzmann GmbH & Co. KG (MF)
Schoenau, Germany
+49 07673 8208-0 Fax: +49 07673 8208-188
Contact: Markus Gromer, CEO
Business: Heinzmann GmbH is one of the leading suppliers worldwide in the field of mechanical and electronic speed control systems for Diesel, Gas and Dual Fuel engines as well as for Gas Turbines. The product range includes system solutions for Air Fuel Ratio Control, Power Management, ETI, including Common Rail. They are used in genset, marine, agriculture, construction, locomotive and vehicle applications.

Jonathan Lew (AF)
Benicia, CA
(707) 748-1734
Contact: Jonathan Lew, Student
Business: Student at Solano Community College.

LOFA Industries Inc. (DD)
Roswell, GA
(770) 569-9828 Fax: (770) 569-9829
Contact: Peter Herbrand, President
Business: LOFA is a distributor for Bedia level and temperature sensors, KAT ignition switches and master battery disconnects, ehb electronics engine and generator control modules and Tyco Electronics/Crompton Instruments generator protection, control and metering.

Pinellas County Fleet Management (AE)
Largo, FL
(727) 582-3000 Fax: (727) 582-3061
Contact: Richard Langner, Operations Manager
Business: Governmental Agency

Rainbow Rehabilitation (AD)
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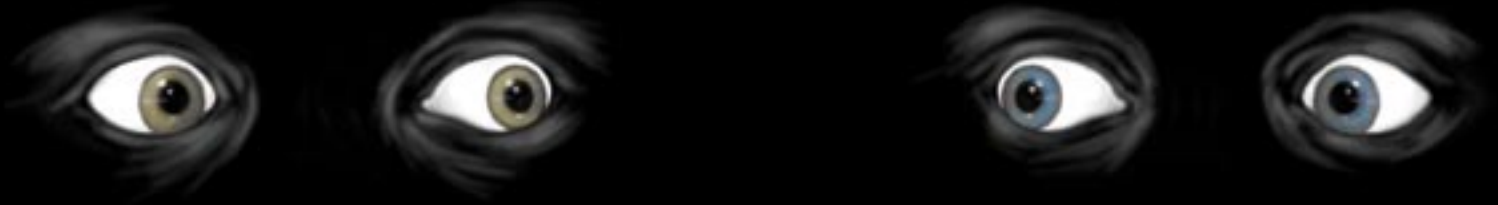


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Contact: Al Boehk, Service Training Supervisor
Business: Caterpillar Dealer

Trevor Steffler (AF)
Shelley, ID
(208) 521-0702
Contact: Trevor Steffler, Student
Business: Student at Idaho State University's Energy Systems Technology program.

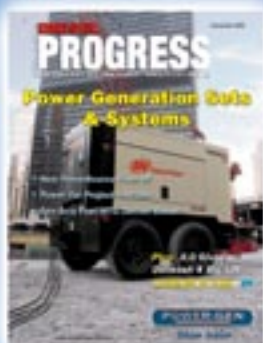
United Motors & Heavy Equipment Co. LLC. (DD)
Dubai, United Arab Emirates
+971 4 8813888 Fax: +971 4 8812233
Contact: Sreenivasa Devajji, Sales Manager
Business: Distributor/Importer for diesel/gas engines and generator sets manufactured by MAN Nutzfahrzeuge AG, Germany in the United Arab Emirates.

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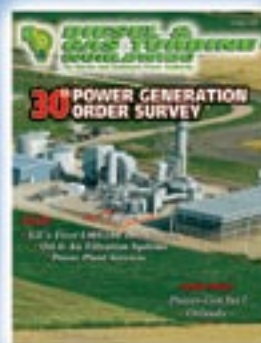


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